REMARKS

Claims 1-7 remain pending. Claims 1 and 7 have been amended. Claims 8-12 were previously withdrawn in response to a restriction requirement. Claims 13-15 were previously canceled without prejudice to filing of continuation application(s) directed thereto.

The Examiner has rejected claims 1-3 as anticipated under 35 U.S.C. 102(e) in light of U.S. Patent No. 6,194,777 to Abbott ("the Abbott patent"). These claim rejections are overcome as follows.

As described extensively in the specification of the instant patent application, embodiments in accordance with the present invention relate to semiconductor device package designs exhibiting efficient utilization of occupied circuit board space. One technique employed by embodiments of packages in accordance with the present invention is the use of leads having exposed lead portions which fold back underneath the body of the package. In order to emphasize this aspect of the present invention, pending independent claim 1 has now been amended to recite folding of exposed lead portions underneath the package body.

The Abbott patent relied upon by the Examiner to reject claims 1-3 describes semiconductor device packages featuring exposed leads of various shapes. However, none of the packages described or illustrated in the Abbott patent show an exposed lead folding underneath the package body, as is recited in pending independent claim 1. In particular, the package depicted in Figure 4c shows a lead foot which folds underneath the portion of the lead extending from the side of the package. However, the foot of the lead of the package shown in Figure 4c does not extend underneath the body of the package itself.

Based upon the failure of the Abbott patent to teach or suggest all of the elements now recited in independent claim 1, it is respectfully asserted that claims 1-3 are not anticipated by this reference. Claim rejections based upon the Abbott patent should accordingly be withdrawn.

The Examiner has also rejected claims 1 and 3 as anticipated under 35 U.S.C. 102(e) in light of U.S. Patent No. 6,114,759 to Okuaki et al. ("the Okuaki patent"). The Examiner has further rejected claim 5 as obvious under 35 U.S.C. 103 in light of the Okuaki patent. These claim rejections are overcome as follows.

The Okuaki patent does describe various designs for semiconductor device packages. As with the Abbott patent, the lead feet of the packages of the Okuaki patent do fold back underneath exposed lead portions. Again however, the lead feet of the packages of the Okuaki patent do not extend underneath the package body itself.

Moreover, there is no teaching or suggestion in the Okuaki patent that the lead feet should extend beneath the package body. Specifically, the main issue addressed by the Okuaki patent is unwanted peeling of a package off of the circuit board to which it is soldered. To avoid this problem, the various exposed lead shapes of Figures 2-10 extend a substantial lateral distance outward from the side of the package body. The package designs of the Okuaki patent are thus not concerned with conserving area on the printed circuit board occupied by the footprint of the package.

Because packages of the Okuaki patent fail to teach or even suggest folding of exposed lead portions underneath the package body as is now recited by independent claim 1, it is respectfully asserted that rejection of claims 1, 3, and 5 in light of the Okuaki patent is improper. These claim rejections have been overcome and should accordingly be withdrawn by the Examiner.

The Examiner has also rejected claims 1, 3-4, and 6 as anticipated under 35 U.S.C. 102(e) in light of U.S. Patent No. 6,111,312 to Hiramuta et al. ("the Hiramuta patent"). The Examiner has further rejected claim 7 as obvious under 35 U.S.C. 103 under the Hiramuta patent in light of U.S. Patent No. 6,433,418 to Fujisawa et al. ("the Fujisawa patent"). These claim rejections are overcome as follows.

As described in the specification of the instant application, embodiments of packages in accordance with the present invention are optimized to house does for vertical conduction devices such as MOSFETs and discrete transistors, where direct contact between the die and the diepad lowers electrical and thermal resistance.

Embodiments of packages in accordance with the present invention may include one or more leads integral with the diepad supporting the die. Such diepad-integral leads promote efficient conduction of thermal energy out of the package, allowing heat from an operating die to be conveyed out of the package body via the diepad, for dissipation into the environment.

In order to emphasize this aspect of the present invention, independent claim 1 has now been amended to recite a package which includes a diepad and a first lead integral with the diepad. A second package lead not integral with the diepad is in electrical communication with the diepad through a bondwire.

Turning now to claim rejections based upon the Hiramuta patent, this patent also describes a semiconductor device package having a number of specific attributes. Conspicuously lacking from the teachings of this reference, however, is a semiconductor package design featuring leads that are integral with the diepad. Specifically, in the figures of the Hiramuta patent, the package lead is illustrated as being discrete from the diepad and in electrical communication with the diepad through a bond wire. Such is not the case with packages in accordance with the claimed embodiments of the present invention, wherein at least one lead is integral with the diepad, thereby offering the advantage of enhanced conductance of thermal energy out of the package.

Because the Hiramuta patent fails to teach or even suggest each of the elements recited in claim 1, it is respectfully asserted that rejection of claims 1 and 3 as anticipated in light of the Hiramuta patent has been overcome. These claim rejections should be accordingly be withdrawn by the Examiner.

Regarding the obviousness rejection of dependent claim 7, the Fujisawa patent combined with the Hiramuta patent also fails to teach or suggest a lead that is integral with a diepad. Specifically, packages pictured and described in the Fujisawa patent relate to a package having leads that are non-integral with a diepad. Because the combination of the Hiramuta and Fujisawa patents fail to teach this element of dependent claim 7, it is respectfully asserted that this claim cannot be considered bvious in light of the references relied upon by the Examiner.

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. Issuance of a formal Notice of Allowance at an early date is thus respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (650) 326-2400 x5423.

Respectfully submitted,

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